$a, b > 0$: $r, s \in \mathbb{Z}$,

$$
\begin{aligned}
a^r \cdot a^s &= a^{r+s} \\
a^r : a^s &= a^{r-s} \\
(a^r)^s &= a^{rs} \\
(a \cdot b)^r &= a^r \cdot b^r \\
\left(\frac{a}{b}\right)^r &= \frac{a^r}{b^r}
\end{aligned}
$$

$n \in \mathbb{N}$:

$$
\begin{aligned}
(a+b)^2 &= a^2 + 2ab + b^2 \\
(a-b)^2 &= a^2 - 2ab + b^2 \\
(a-b)(a+b) &= a^2 - b^2 \\
(a+b)^3 &= a^3 + 3a^2b + 3ab^2 + b^3 \\
(a-b)^3 &= a^3 - 3a^2b + 3ab^2 - b^3 \\
a^3 - b^3 &= (a-b)(a^2 + ab + b^2) \\
a^3 + b^3 &= (a+b)(a^2 - ab + b^2)
\end{aligned}
$$

$a, b > 0 \quad n, m \in \mathbb{N}$:

$$
\begin{aligned}
\sqrt[n]{a}.\sqrt[n]{b} &= \sqrt[n]{ab} \\
\frac{\sqrt[n]{a}}{\sqrt[n]{b}} &= \sqrt[n]{\frac{a}{b}} \\
(\sqrt[n]{a})^m &= \sqrt[n]{a^m} \\
\sqrt[m]{\sqrt[n]{a}} &= \sqrt[mn]{a}. \\
\sqrt[n]{a^n.b} &= a.\sqrt[n]{b}
\end{aligned}
$$

$$
\begin{aligned}
\frac{\frac{a}{b}}{\frac{c}{d}} &= \frac{ad}{bc} \\
\frac{ad}{bd} &= \frac{a}{b} \\
\frac{a}{b} &= \frac{ad}{bd}
\end{aligned}
$$